

Short case report

Gonococcal arthritis in an infant

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Infections with *Neisseria gonorrhoeae* usually occur on mucosal surfaces and predominantly on those of the genito-urinary tract and the rectum (Kellogg and Thayer, 1969). Other sites which may be infected include the joints, heart, blood stream, eyes, and mouth. An infected mother may transmit the organism to her offspring *in utero*. The maternal birth canal is usually the source of the organism in neonatal infections and any orifice of the infant may act as a portal of entry (Sponzilli and Calabro, 1961). The genital orifices, rectum, and conjunctivae, mouth (Gaing, Cossoy, and Anguilar Giraldez, 1941), nares (Canino, 1931), and umbilicus (Butti and Cucullu, 1933) may be involved.

The present report presents a case of gonococcal arthritis probably attributable to prenatal infection.

Case report

A 6-week-old male infant was noted at a routine medical check-up to have painful swelling of the right elbow joint. He was admitted on the following day to St. Christopher's Hospital for Children. His mother, who had been delivered at another hospital, had developed arthritis during the 9th month of pregnancy; and a cervical culture had grown *N. gonorrhoeae*. She had been treated with tetracycline after the baby was born and had remained in the hospital for 2 weeks. When the infant had been discharged from the hospital at 2 weeks of age he was presumably well, but 2 days after his discharge his mother noticed a swelling of his right wrist, which subsided in 3 days. Then the right ankle became progressively swollen, but the swelling regressed in 2 days. Swelling of the right arm had also been noticed for 2 to 3 weeks before admission and had since receded. The infant had seemed to be in pain and resisted movement of the arm, according to his mother. Trauma was denied by the parents.

The baby had been eating and gaining weight well and no fever or excessive irritability was noted. There was no rash and he seemed to be developing normally. There was a history of rheumatoid arthritis in the family; the maternal grandmother had diabetes mellitus.

Examination

The infant was found to be a well-developed baby in no real distress lying with his right arm in fixed pronation, with a slight flexion at the elbow. He weighed 4,015g. and vital signs were normal. There was a diffuse miliarial rash on the head. There were no signs of inflammation in the eyes, ears, nose, or throat; the neck was supple. The lungs were clear. No heart murmur was noted. The abdomen was difficult to palpate, but no masses were felt at a later examination. The liver was just below the right costal margin. With the exception of the right arm, the extremities were normal. The right arm was swollen from the mid arm to just below the elbow. There seemed to be some small amount of fluid in the joint which was markedly larger than the left elbow and the baby cried when it was moved or palpated vigorously. He had a good suck and the neurological examination was normal.

The impression at the time of admission was arthritis, probably gonococcal. The initial X-ray revealed soft tissue swelling over the right elbow with some fluid within the joint. There was evidence of bone destruction at the distal end of the humerus and a periosteal reaction surrounding the distal humerus and proximal ulna. The findings were indicative of inflammatory disease in the soft tissue of the right arm with fluid in the joint and osteomyelitis. Haematological studies showed 17,600 white blood cells per cu. mm., with 85 per cent. lymphocytes and 15 per cent. neutrophils; the haemoglobin was 9.7 g. per cent. Aspiration of the right elbow was performed. The Gram-stained joint fluid revealed many neutrophils and a few Gram-negative extracellular diplococci. A culture of the fluid yielded *N. gonorrhoeae*.

Treatment

The infant was given 400,000 units aqueous penicillin G (intravenously) every 4 hrs. This therapy was continued for 2 weeks, after which the regimen was changed to intramuscular penicillin every 6 hrs. One week after admission and institution of therapy, a second joint aspiration yielded only a small amount of fluid. A Gram-stained smear revealed a few Gram-negative diplococci; culture produced no growth. The erythrocyte sedimentation rate, which had been 100 mm./1st hr on admission, was 14 mm./1st hr 2 weeks after the initiation of therapy. At this time x-ray changes were still evident. The rheumatoid factor test was negative and a venereal disease reference laboratory (VDRL) test for syphilis was non-reactive.

Results

The infant remained afebrile throughout his hospital course and was discharged approximately 4 weeks after admission. The diagnosis was gonococcal arthritis with osteomyelitis.

LABORATORY INVESTIGATION OF THE ORGANISM

The joint fluid was inoculated onto two blood agar (BA) plates, a chocolate agar plate, and a Thayer-Martin (T-M) agar plate. One BA plate was incubated aerobically and one anaerobically. The chocolate and T-M agar plates were incubated under 5–10 per cent. CO₂ tension in a candle extinction jar. All specimens were incubated at 35°C. for 24 hrs. A Gram-stained smear of the fluid showed many neutrophils and a few extracellular Gram-negative diplococci. The chocolate and T-M agar plates yielded small (1–3 mm.), transparent, greyish colonies. Growth was not apparent on the BA plates. The oxidase test was performed on both plates containing colonies by adding 2 drops of 0.5–1.0 per cent. N, N-dimethyl-p-phenylenediamine monohydrochloride solution to several of the colonies. The colonies were oxidase-positive; a smear of colonies from each plate revealed Gram-negative diplococci. Cystine tryptic agar (CTA) sugars were inoculated for identification of the *Neisseria* recovered. After 24 hrs' aerobic incubation at 35°C., it was found that dextrose was fermented with the production of acid, but maltose and sucrose were not. The organism was identified as *Neisseria gonorrhoeae*. Sensitivity tests performed on chocolate agar showed the organism to be sensitive to penicillin, chloramphenicol, cephaloridine, terramycin, kanamycin, ampicillin, and gentamicin; it was resistant to colomycin.

Discussion

Primary gonococcal infection of the genito-urinary tract in the female may be asymptomatic, or symptoms may be so slight as to go unnoticed (Kellogg and Thayer, 1969). In this case an asymptomatic mother infected with *N. gonorrhoeae* before or during gestation became aware of her infection because of the development of arthritis, and cervical cultures yielding gonococci. Treatment was started after the infant was born; infection was probably present in the baby at birth but symptoms were not conspicuous. The portal of entry of the organism may have been the rectum or umbilicus, with haematogenous spread to the joint spaces. There were no signs of inflammation in the penis, throat, ears, eyes, or nose. The origin of the miliarial rash on the head is obscure, but one may surmise that it was a manifestation of gonococcaemia. Cutaneous involvement in the form of erythematous papules surmounted by a haemorrhagic

or vesiculopustular lesion tends to be present in some patients with acute gonococcal arthritis before bacteriological evidence is apparent (Keiser, Ruben, Wolinsky, and Kushner, 1968). With modern therapy recovery was uneventful.

Gonococcal arthritis in the newborn was formerly a serious illness. Fourteen deaths out of a total of 26 cases of gonococcal arthritis in newborns were reported by Holt (1905). In 1927 an outbreak of arthritis due to *N. gonorrhoeae* occurred in a maternity hospital in Philadelphia, and 53 cases of gonococcal arthritis were reported out of a total of 182 births. Epidemiological studies showed that all these infants, being from the same ward, probably became infected through contaminated fomites, and since many infants had proctitis the rectal thermometer was implicated (Cooperman, 1928); no deaths occurred among these infants.

Summary

A case is described in an infant of gonococcal arthritis proven by culture of joint aspirate. The infection was transmitted from mother to infant, probably *in utero*. The mother did not have symptoms of gonorrhoea until she developed arthritis and subsequently yielded *N. gonorrhoeae* through a cervical culture. Both patients were successfully treated with antibiotics.

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Arthrite gonococcique chez un enfant

SOMMAIRE

On décrit un cas d'arthrite gonococcique chez un enfant prouvée par la culture du liquide aspiré de l'articulation. L'affection avait été transmise de la mère à l'enfant, probablement *in utero*. La mère ne présentait pas de symptômes de gonococcie jusqu'au moment où apparut une arthrite et, ultérieurement, *N. gonorrhoeae* fut obtenu dans une culture cervicale. Les deux malades furent traités avec succès par les antibiotiques.